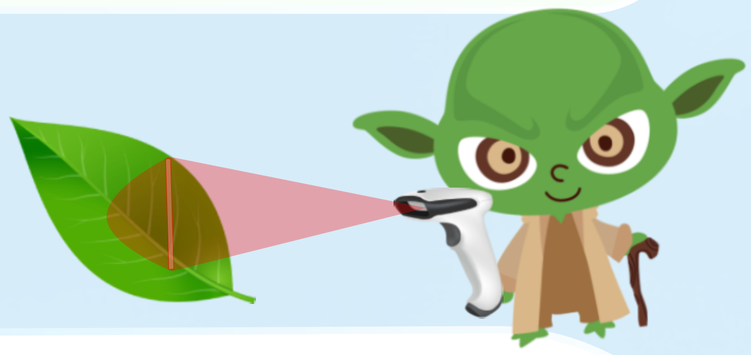
SCANNING LEAVES TO BETTER UNDERSTAND CLIMATE CHANGE

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Why I (and you should) care

Global warming is causing rapid range shifts in ecosystems all over the world, particularly in mountains. Plants are highly affected due to their lack of mobility within one generation, meaning that their adaptations are mainly focused on **functional traits**. Researching the change of traits in **montane species** when facing stressors like competition from range shifts and increasing temperatures can therefore be used to predict how well plants worldwide might react to current climate change. This is the aim of the **RangeX project**, which this study aims to contribute to.

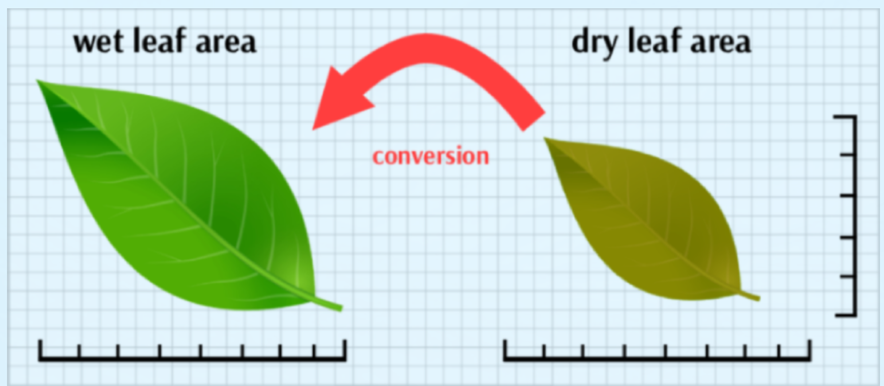


Figure 3: I use dry leaf area data to calculate wet leaf area

What I did

I scanned dry leaves using an image scanner (see figure 1) in order to produce masks that were used to calculate **leaf area** in R (see figure 2). I then used the data of dry leaf area with already existing wet (fresh) leaf area data to calculate a **conversion factor**. This can be used to calculate the leaf area of fresh leafs from dry leafs (see figure 3)



Figure 1: The equipment used for scanning leaves; image scanner (left), envelope (lower left), barcode scanner (right)



Figure 2: A mask produced by a scan

Results

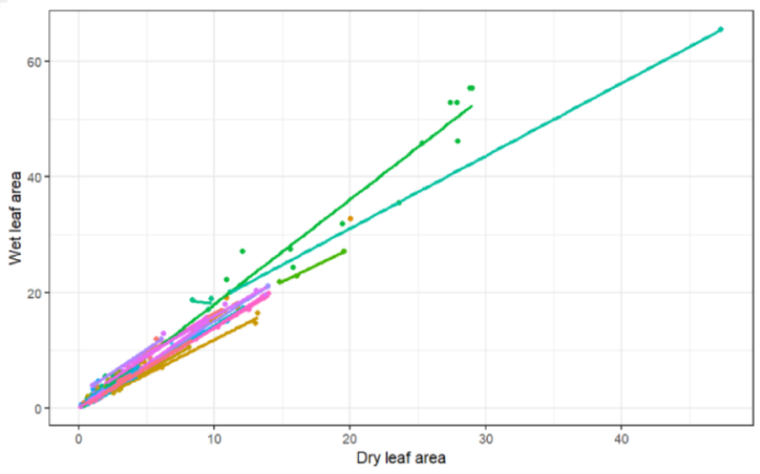
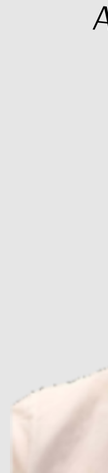


Figure 4: Each color represents a species. Plotting the wet leaf areas against the dry leaf areas shows a **linear relationship**. By dividing the sum of wet leaf areas with the sum of dry areas for each species, I find that the inclines vary between 1 and 2,2.

My results show that the **conversion factor** for dry to wet leaf area vary widely between species, falling somewhere **between 1 and 2,2**.



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